Listing of Claims:

1. (Currently amended) A system for non-contact dimensional measurement of ~~a~~ an essentially circularly symmetric workpiece, comprising:

a processor;

a memory coupled to the processor and including a sensor arm module, a sensor head module, and a wireframe module;

a sensor arm movable in lateral, longitudinal, and transverse directions and in communication with the processor; and

a sensor head coupled to the sensor arm, the sensor head including,

a light source for producing a light to contact a surface of the essentially circularly symmetric workpiece, and

a detector for sensing a portion of reflected light from the workpiece, the detector generating a signal indicative of the proximity of the workpiece,

wherein the sensor arm and head modules direct the sensor arm and sensor head to perform proximity measurements along three parallel, lateral tracks extending along a longitudinal length by moving the sensor head in proximity to and continuously along each lateral track,

wherein the wireframe module determines a curve fit of the workpiece based on the proximity measurements and further determines the diameters of the workpiece along the longitudinal length, the centers corresponding to the diameters, and generates a workpiece profile

~~the diameters of the workpiece along the longitudinal length based on the proximity measurements and generates a workpiece profile~~.

2. (Original) The system of claim 1, wherein the light source comprises a laser light diode.

3. (Original) The system of claim 1, wherein the wireframe module determines the location of a crown of the workpiece based on the diameters.

4. (Original) The system of claim 1, wherein the sensor head further comprises a roughness detector configured to receive a second portion of reflected light and generate a signal indicative of the roughness of the surface of the workpiece.

5. (Original) The system of claim 1, wherein the detector generates signals indicative of the proximity of the surface of the workpiece based on the intensity and position of the portion of the reflected light.

6. (Original) The system of claim 1, wherein the sensor head further comprises a focusing optic for directing light emitted from the light source to the surface of the workpiece.

7. (Original) The system of claim 1, further comprising an optic configured to direct the portion of reflected light to the detector.

8. (Original) The system of claim 1, further comprising an archive for storing diameters and workpiece profiles.

9. (Original) The system of claim 1, wherein the memory further comprises an interface module for receiving user input and displaying diameters and the workpiece profile.

10. (Currently amended) A method for determining the diameter measurements of ~~a~~ an essentially circularly symmetric workpiece to generate a workpiece profile, the method comprising:

locating three parallel, lateral tracks on a surface of the essentially circularly symmetric workpiece, each track extending along a longitudinal length;

moving a sensor head along the three lateral tracks, wherein movement along each track is substantially continuous;

directing light from a single light source on the sensor head to the three lateral tracks along the longitudinal length;

measuring the intensity and position of a portion of reflected light from the surface of the workpiece along the three lateral tracks to determine proximity measurements;

determines a curve fit of the workpiece based on the proximity measurements;

determining the diameters of the workpiece along the longitudinal length, and the centers corresponding to the diameters, based on the proximity measurements; and

generating a workpiece profile based on the diameters of the workpiece.

11. (Original) The method of claim 10 further comprising computing the slope of the workpiece along the longitudinal length.

12. (Original) The method of claim 10 further comprising:

measuring the intensity of a second portion of reflected light from the surface of the workpiece to determine a roughness measurement; and

computing the roughness of the surface of the workpiece based on the roughness measurement.

13. (Original) The method of claim 10 further comprising storing the workpiece profile in an archive.

14. (Original) The method of claim 10 wherein the light source comprises a laser light diode.

15. (Original) The method of claim 10 further comprising determining the location of a crown of the workpiece based on the workpiece profile.

16. (Original) The method of claim 10, further comprising focusing light emitted from the light source to the surface of the workpiece.

17. (Original) The method of claim 10, further comprising displaying diameters and a workpiece profile for the workpiece.

18. (Currently amended) A computer readable medium having stored thereon computer executable instructions for performing a method for determining diameters of ~~a~~ an essentially circularly symmetric workpiece to generate a workpiece profile, the method comprising:

locating three parallel, lateral tracks on a surface of the essentially circularly symmetric workpiece, each track extending along a longitudinal length;

moving a sensor head along the three lateral tracks, wherein movement along each track is substantially continuous;

directing light from a single light source on the sensor head to the three lateral tracks along the longitudinal length;

measuring the intensity and position of a portion of reflected light from the surface of the workpiece along the three lateral tracks to determine proximity measurements;

determines a curve fit of the workpiece based on the proximity measurements;

determining the diameters of the workpiece along the longitudinal length, and the centers corresponding to the diameters, based on the proximity measurements; and

generating a workpiece profile based on the diameters of the workpiece.

19. (Original) The computer readable medium of claim 18 wherein the method further comprises computing the slope of the workpiece along the longitudinal length relative to the single light source.

20. (Original) The computer readable medium of claim 18, the method further comprising:

measuring the intensity of a second portion of reflected light from the surface of the workpiece to determine a roughness measurement; and

computing the roughness of the surface of the workpiece based on the roughness measurement.

21. (Original) The computer readable medium of claim 18, the method further comprising storing the workpiece profile in a memory.

22. (Original) The computer readable medium of claim 18, the method further comprising determining the location of a crown of the workpiece based on the workpiece profile.

23. (Original) The computer readable medium of claim 20, the method further comprising displaying diameters and the workpiece profile.

24. (Currently amended) A system for non-contact dimensional measurement of ~~a~~ an essentially circularly symmetric workpiece rotated about a longitudinal axis, comprising:

processing means;

memory means coupled to the processing means and including sensor control means and a wireframe means; and

sensing means movable in lateral, longitudinal, and transverse directions and in communication with the processing means, the sensing means including,

light source means for producing a light to contact a surface of the essentially circularly symmetric workpiece, and

detecting means for sensing a portion of reflected light from the workpiece, the detecting means generating a signal indicative of the proximity of the workpiece,

wherein the sensor control means directs the sensing means to perform proximity measurements along three parallel, lateral tracks extending along a longitudinal length by moving the sensing means in proximity to and continuously along each lateral track,

wherein the wireframe means determines a curve fit of the workpiece based on the proximity measurements and further determines the diameters of the workpiece along the longitudinal length, the centers corresponding to the diameters, and generates a workpiece profile ~~the diameters of the workpiece along the longitudinal length based on the proximity measurements~~.